

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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SECURITY INFORMATION

COUNTRY	USSR (Moscow Oblast)	REPORT	25X1
SUBJECT	Colorimeter Apparatus Designed at Institute 160, Fryazino	DATE DISTR.	30 June 1953
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This is UNEVALUATED Information

THE SOURCE EVALUATIONS IN THIS REPORT ARE DEFINITIVE.
THE APPRAISAL OF CONTENT IS TENTATIVE.
(FOR KEY SEE REVERSE).

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GENERAL

1. at Institute 160, Fryazino, the Chemical Department 25X1
Dr. Michels, a German chemist, and Dr. Dobrak, a German mathematician. Both Germans returned to Germany in December 1950.

2. detail sketches of the first device (see Pages 5, 6, 7, and 8) 25X1
The second device (see Pages 9, 10, and 11)

25 YEAR RE-REVIEW

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FIRST TYPE OF COLORIMETER

3. This apparatus was to be used in comparing the color composition of the cathode paste, used as a coating for the raster plate in both the supericonoscope and iconoscope, and for the cathodes in the kinescopes and receiver radio tubes.

4. The cathode paste to be tested in this device came from the Chemical Department of Institute 160.

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5. Dr. Dobrak calculated the dimensions for the interior diameter of the reflecting spheres and for the crystal glass prisms and all distances between prisms and glass filters.

6. The layout of this equipment is shown on [] sketch (see Page 5), and the plan view is illustrated on the second sketch (see Page 6). Using the latter as a guide, [] the following information regarding the first type of colorimeter:

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a. In the upper left corner is a lamp housing containing a nickel-plated reflector with a clear glass 200-watt candle-shaped lamp operating on 220 volts, 50 cycles, a-c. This lamp carriage is adjustable in the horizontal plane only for purposes of altering the focal length.

b. This artificial light shines through an aperture in the lamp housing to the first lens, approximately 190 mm. directly in front of the lamp. It is to be noted here that throughout this device all interior surfaces were coated with a dull black paint except where otherwise specified.

c. This first lens is separated from the second lens by approximately 80 mm.

d. Area "D", located between the first and second lens (see Page 6), was called the condenser. A slide containing four glass color filters, four metal plates, and four knobs was located in the exact center of the two lenses. See "Detail of Colored Glass Filter Plates" and "Cross Section Detail of Filter Plates" (Pages 7 and 8 respectively). Each of these four glass filter plates was approximately 40 mm. x 40 mm. in area. The colors used in these filter plates were green, red, blue, and opal white. The back of each color filter had a metal plate which was individually adjustable in the vertical plane to control the passage of light determined necessary to filter through. The knobs which controlled the metal plates had fifty divisions etched on them (50 divisions per single 360 revolution). Each complete single revolution of the knob represented a half millimeter excursion of the metal plate; thus, to permit one millimeter of light to be blanked off, that particular knob was rotated two complete revolutions. These four glass color filters were used to determine which color was needed in the composition of the cathode paste.

e. The lamp light passes from this condenser area through another span of 190 mm. and enters an aluminum sphere

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25X1

approximately 100 mm. in diameter. One coat of cathode paste was sprayed on the interior surface of this sphere. This was the cathode paste coating that was under examination.

- f. The reflected light from the cathode paste then passes through a collar and wafer. The opening of this wafer was circular and cone-shaped. Wafers with varied-size openings were available.
- g. The reflected light passes through this first opening via a metal pipe, the inside of which was painted a dull black, to the first crystal prism. The distance from the perimeter of the sphere to the center of the prism was approximately 140 mm.
- h. From this prism the reflected light travels at right angles to the comparison prism, a distance of 194 mm. (shown on Page 6). This center prism was approximately 180 mm. away from the eyepiece.
- 7. The cathode paste was placed - not sprayed - on a glass dish or plate (see lower left corner of Page 6), and, upon striking the paste, daylight - not electric light - is reflected upwards approximately 80 mm. to the first prism (see Page 5). From this prism it is then reflected to the two-millimeter thick crystal glass plate, which was set at a 45° angle. This distance is approximately 160 mm. The light pierces this crystal and arrives at the comparison or center prism, a distance of approximately 194 mm., and from there it is guided to the eyepiece.
- 8. However, in the event that the intensity of the daylight is insufficient for the foregoing comparison test, a portion of the light from the electric projection lamp is then by-passed (see Page 6) through a prism and then through a smaller sphere. This aluminum sphere was approximately 40 mm. in diameter and had also been sprayed with the same cathode paste as that in the larger sphere.
- 9. This artificial light is then reflected at right angles to, and through, another prism approximately 80 mm. away. This prism then reflects this artificial light approximately 80 mm. to the two-millimeter-thick crystal glass plate, which was fixed at 45° and reflects to the comparison prism.
- 10. Attention is invited to the fact that this artificially reflected light joins and travels parallel with the natural reflected daylight, meeting at the comparison prism, and thence to the eyepiece.

SECOND TYPE OF COLORIMETER

- 11. The purpose of this second type colorimeter was the same as that of the first. This particular device (illustrated on Pages 9 and 10) was the same as the first type of colorimeter in all details except the following:
 - a. The condenser with two lenses was not incorporated into the design.

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b. In the event additional daylight was needed, the shutter openings of the color plates could be enlarged to a maximum of 50 x 50 mm., whereas in the first device this opening was limited to 20 x 20 mm. for the maximum. (Details of this are shown on Page 11.)

12. The second device, without condenser, was substituted on occasions to compare both systems. [] the Soviets considered the first device to be better for the purposes of comparing the pastes because the second lost too much light. 25X1

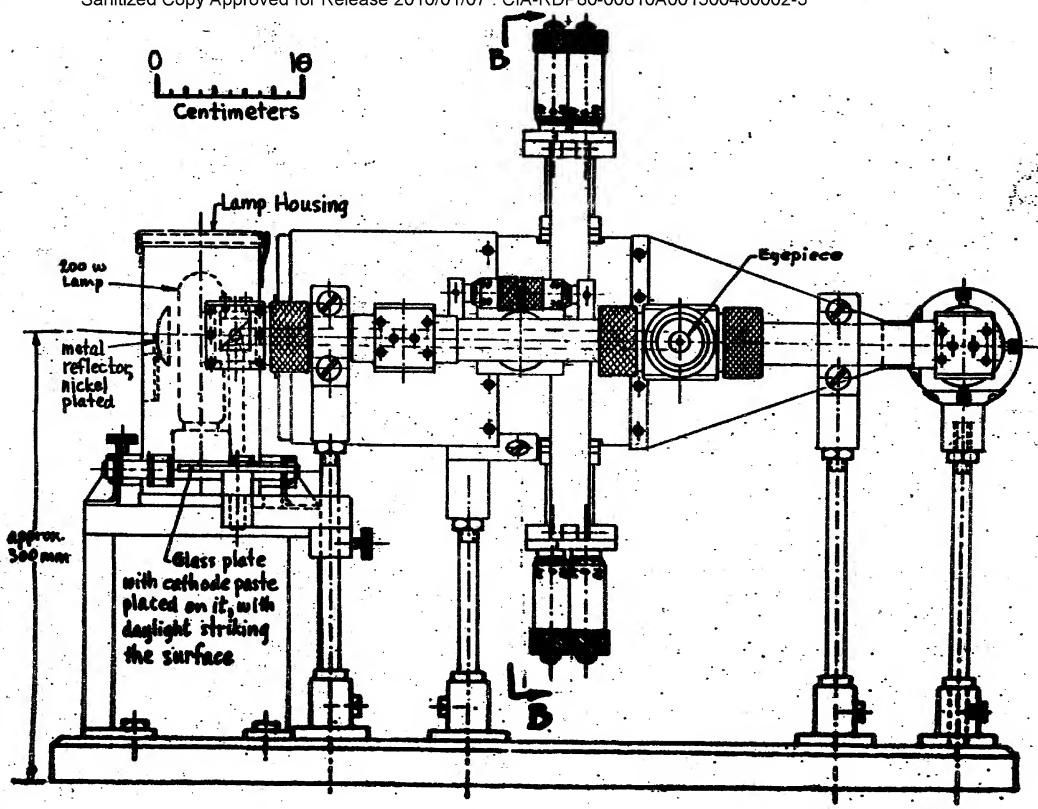
13. All parts, including the crystals used in both colorimeters, were of Soviet origin.

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FRONT VIEW of COLORIMETER APPARATUS
(FIRST TYPE)

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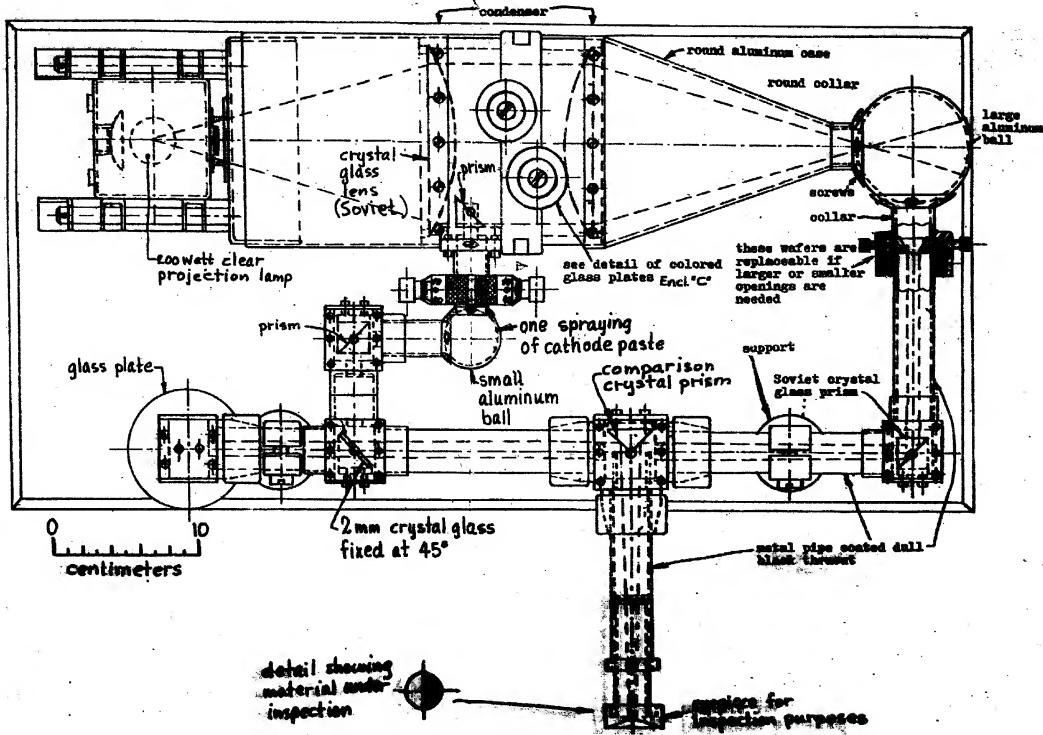


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PLAN VIEW of COLORIMETER
(FIRST TYPE)

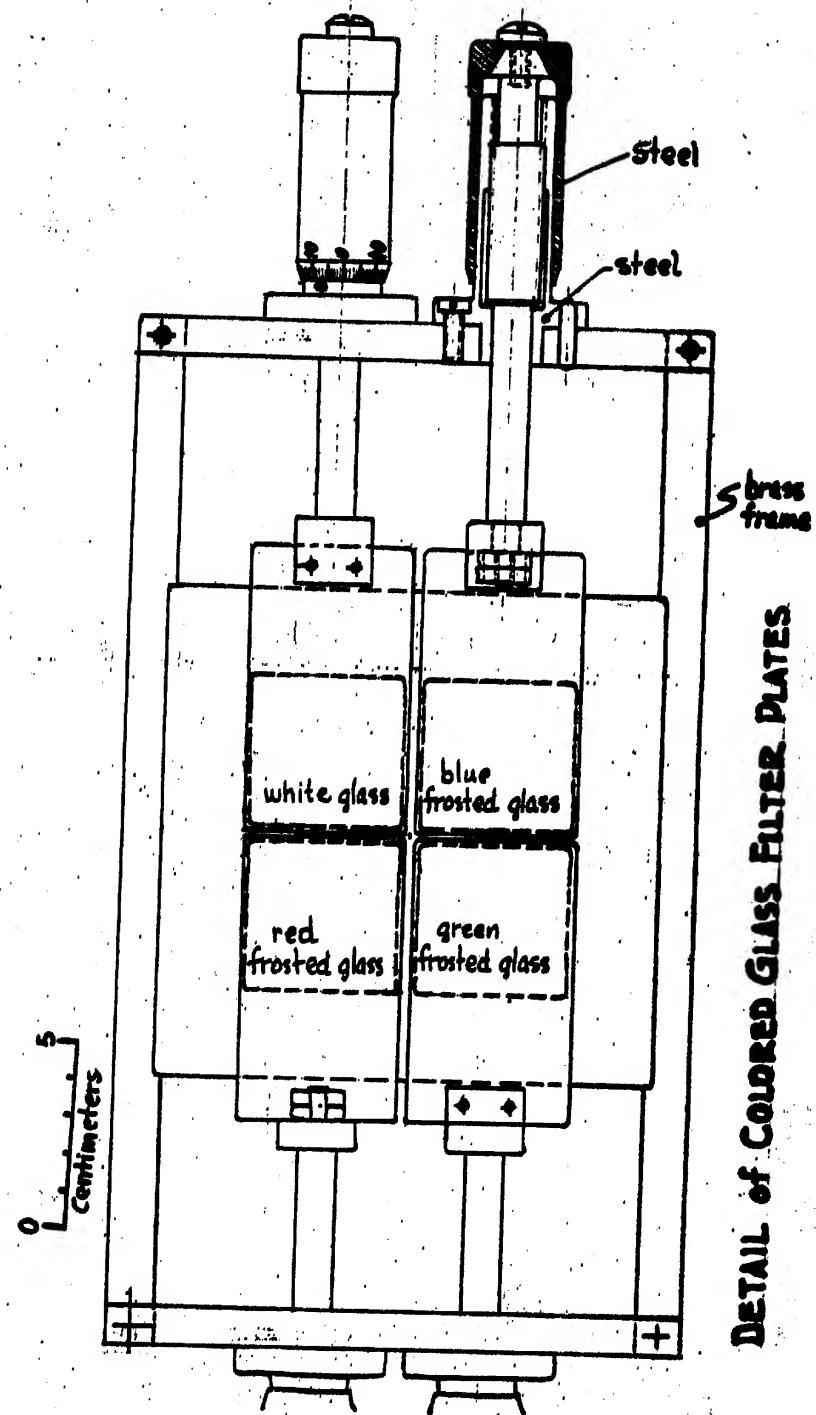
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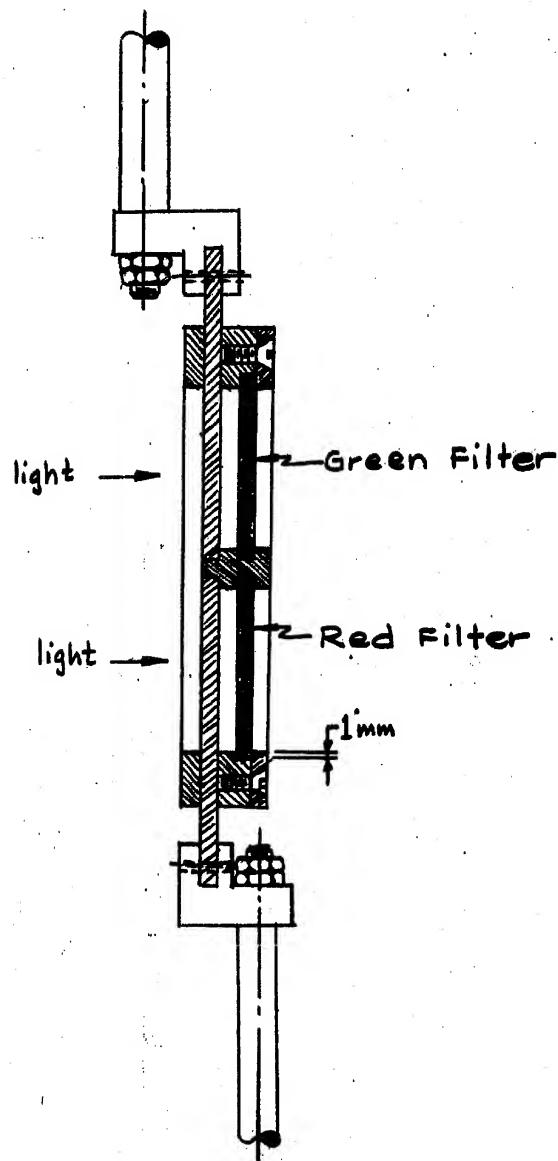
DETAIL of Colored Glass Filter Plates

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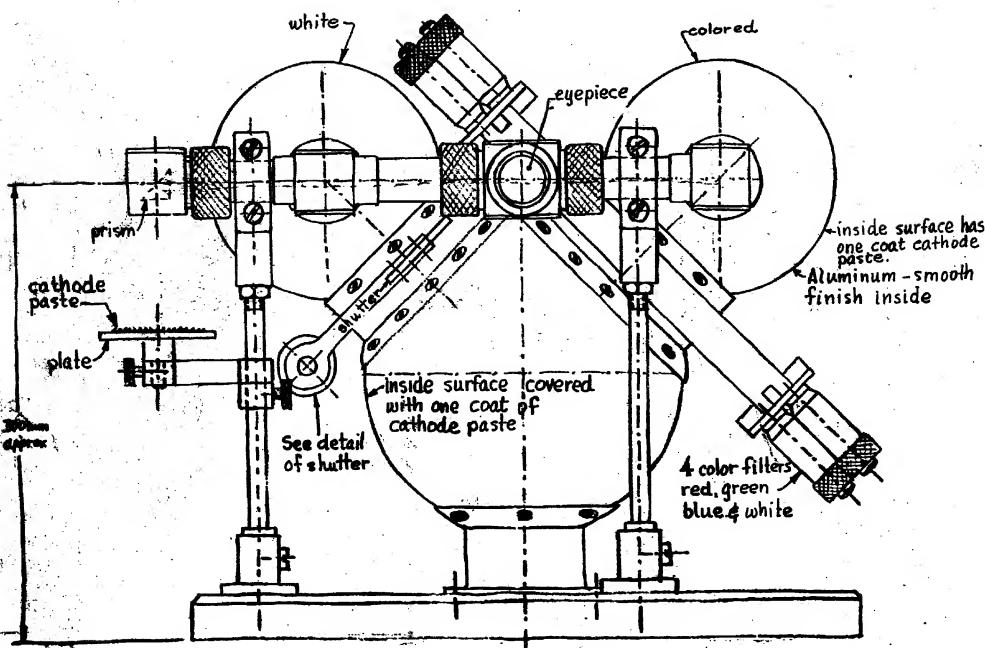


Cross Section Detail of Filter Plates (First Type)

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**SIDE VIEW - COLORIMETER APPARATUS
(SECOND TYPE)**

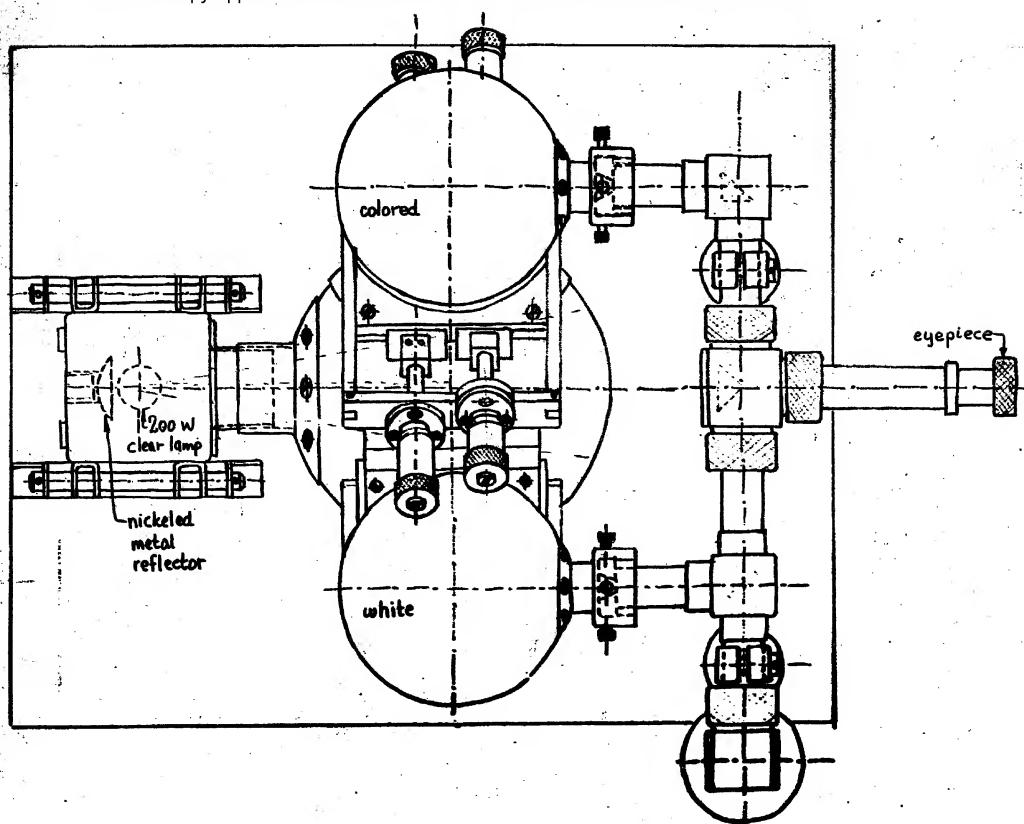
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PLAN VIEW - COLORIMETER APPARATUS
(SECOND TYPE)

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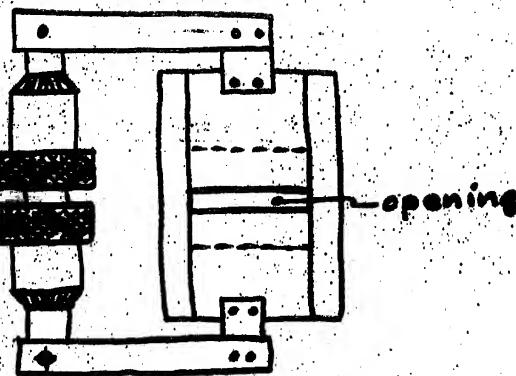
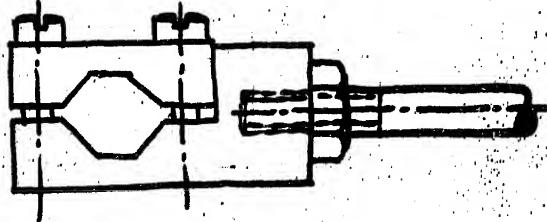
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Detail of shutter for Blending Artificial and
White Light (Second Type)

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